TO ASSESS THE PROFICIENCY OF THE BLIND AS TAPE DUPLICATOR OPERATORS (RD-2049-S)

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THE VIRGINIA COMMISSION FOR THE VISUALLY HANDICAPPED
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SIGNIFICANT FINDINGS FOR THE REHABILITATION WORKER

The purpose of this Project was to demonstrate that blind and visually handicapped individuals can perform magnetic tape duplicating processes and related jobs.

At the present time, one totally blind and three legally blind persons are successfully performing tape duplication jobs to the satisfaction of their employers. Their duties include quality control, tape duplication and related functions such as splicing, minor machine repair, and simple record keeping. Three of these clients are working in a private commercial setting and the other is employed in the Virginia State Library for the Blind and Physically Handicapped at the Virginia Commission for the Visually Handicapped.

In the selection of clients to be trained as tape duplicators, personal appearance is important; however, it is not a prime consideration as in most instances operators are not required to meet the public. Duties on the job generally do not require frequent moving about in unfamiliar surroundings thus mobility training may be concentrated on the clients reaching the job and returning home. However, this job may have related duties requiring the client to move about and in these cases the client must have the necessary mobility skills. The intellectual level needed to perform duplicating operations is related to the complexity of the operation. It appears that a person with dull normal intelligence could perform the duties of a simple duplicating machine operator. However, if the job requires additional tasks such as labeling, record keeping, and note taking, then this calls upon skills in the areas of typing and braille necessitating at least a low average intelligence. A quality control position requires average judgement and, therefore, one could assume that average intelligence would be necessary. Usually when the job requires braille and/or typing, minimal skills will suffice as it is primarily used for labeling purposes. Experience indicates the operator should have normal uncorrected hearing in both ears, as even in the simple duplicating operations there are certain intervals at which checks are made on the quality of tapes by listening to them. This is especially true in commercial settings; however, in public school systems thequality of the tapes is not crucial.

On the average it takes from two to three months to train a tape duplicator operator for a position in the commercial duplicating field. However, this again is related to the complexity of the particular job. Training an individual to perform the duties of a tape duplicator operator is not a difficult process and can be done easily on the job and rehabilitation workers will likely find that employers prefer on-the-job training, learning on the equipment on which the job will be performed.

The higher levels of quality improvement in tape duplication was not found generally to be conducive to performance by a totally blind person because of the utilization of highly complex equipment requiring sight. Salary expectations in tape duplicating positions could be classified in the low average or average scale.

The job placement outlook for blind and visually handicapped persons in the field of tape duplication is promising as the use of tape and reproduction is expanding at a rapid rate. Rehabilitation workers may find job possibilities by surveying the following local sources:

1. Public and private school systems.

2. Commercial tape duplicating industries.

3. Libraries

4. Local, state and Federal government agencies.

5. Radio and television stations.

6. Colleges.

7. Advertising agencies.

TO ASSESS THE PROFICIENCY OF THE BLIND AS TAPE DUPLICATOR OPERATORS

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7/29/69 Letter Request

PREFACE

This project (Research and Demonstration Grant Number RD-2049-S) set out to demonstrate that blind and visually handicapped individuals can perform magnetic audio tape duplicating operations and related jobs.

A group of eight clients was selected from 16 to 37 years of age. Their I.Q.'s varied from 71 to 130 (WAIS - Weschler Adult Intelligence Scale.) and their visual impairment from total blindness to 20/200 in both eyes. Some could read and write Braille and others could type as well as do Braille.

The trainees were given an average two-month training course by a counselor not trained in duplication work -- suggesting that highly specialized or technical training is not necessary for an instructor.

The project was set up and carried out at the Virginia Commission for the Visually Handicapped in Richmond, Virginia. A Viking 235 Tape Duplicator was purchased. A model library was established and the class took over the entire tape duplicating magazine section of the Virginia State Library for the Blind and Physically Handicapped.

Four (50%) of the trainees are now employed - three in private industry and one in a regional library. A fifth was not placed but is considered ready for employment.

The implication of the results of the project is that blind and visually handicapped individuals definitely <u>can</u> be trained in magnetic tape duplication work. With the field widening and the need for duplicating operators increasing at an unprecedentedly fast pace - the opportunities for the blind in this field may be unlimited.

ACKNOWLEDGEMENTS

The Project Supervisor would like to acknowledge the help of Robert Bray, Chief of the Division of Services for the Blind and other Physically Handicapped of the Library of Congress; Alfred Korb, Division of the Blind, the Library of Congress; William T. Coppage, Director of the Virginia Commission for the Visually Handicapped; Joseph H. Wiggins, Supervisor, Vocational Rehabilitation Department, VCVH; T. A. Benham, Director,, Science for the Blind, Haverford, Pennsylvania; Ralph Beistline, Rehabilitation Specialist, Office for the Blind of Pennsylvania; Byron Hawley, Livingston Audio Products of Fairfield, New Jersey; Richard S. Weaver, Weaver Audio Studio of Harrisonburg, Virginia; and Vernon Marvel, Librarian, Virginia State Library for the Blind, VCVH.

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I. INTRODUCTION

The use of magnetic tape for purposes of instruction, business recording and listening pleasure has increased in recent years. As the use of tape increases so does the demand for additional tape duplicating sources and processes.

The Library of Congress has indicated that its need for tape duplication will appreciably increase in the near future. The Library produces "Talking Books" on magnetic tape for the blind and physically handicapped. These books are read onto tape by volunteer readers. The tapes are checked for quality and then sub-master copies are distributed to the regional libraries. The regional libraries duplicate from the sub-master tapes and distribute copies to readers. At the present time, thirteen of the thirty-five regional libraries have established tape programs. As regional libraries include tape duplicating service for their readers, potential positions for blind audio tape duplicators will be created. Commercial organizations that produce "Talking Books" on tape can also be encouraged to hire the visually handicapped in tape duplication, quality control, loading of tapes into cartridges or cassettes, and in distribution.

Some organizations produce and duplicate tapes for distribution to radio stations. These organizations are potential employers of the blind and visually handicapped.

School systems perform varying amounts of tape duplication. Their tapes are used in language laboratories, special education classes, speech classes, and for audio aides to supplement regular academic material.

The Library of Congress has conducted a research program with cassettes for the past several years. The process used to duplicate tape cassettes is particularly adapted to the blind worker, and this promises to be another area offering potential employment for the blind. At the time this demonstration project was initiated the Division of Services for the Blind of the Library of Congress indicated it plans to begin immediate production of recorded material on magnetic tapes in cassette form.

PURPOSE

The purpose of this Audio Tape Duplication Training Program was to assess the performance and capabilities of blind workers in the jobs of tape duplication and distribution after completing a prescribed training course. Clients who completed this training were placed on jobs in commercial settings and in a regional library for the blind. The following were the specific aims of the project:

A. To demonstrate that a blind person can be trained to operate a tape duplicating machine.

B. To test the jobs of tape duplication, labeling, identification and distribution to determine which tasks can be performed efficiently without sight or with severely limited sight.

C. To determine those areas of operation in a regional library setting in which a blind person may be utilized.

D. To determine which tasks in commercial tape duplication can be performed without sight or with severely limited sight.

E. To demonstrate that an instructor, without technical training in tape recording and duplication, can do an adequate job of training blind persons as tape duplicators.

F. To demonstrate that a blind operator can transfer the knowledge and skills acquired from operating a two track duplicating machine to the operation of a four track system.

G. To prepare guidelines to be used in the training of blind persons as tape duplicators.

BACKGROUND INFORMATION

Prior to the beginning of this project, there were few blind or visually handicapped persons operating duplicating equipment. One blind person was employed by Science for the Blind, Haverford, Pennsylvania. Another was employed by the Library of Congress. Duplicating machines operated by the blind were built by T. A. Benham who is also blind. He designed the machines so that they could be easily operated by blind or visually handicapped persons. Mr. Benham is an instructor in physics and engineering at Haverford College and is the founder of Science for the Blind (an organization that distributes tapes of a scientific nature to blind and visually handicapped individuals).

Most regional libraries are not equipped to train blind employees in the methods of duplicating tapes or the various aspects of tape distribution. The training guide (see Table of Contents) will provide the librarian with an outline of how to train employees to operate duplicating equipment. Also, the training guide will serve as a standard training manual for the blind or visually handicapped tape duplicator and will be applicable to many duplicating settings.

Since the number of regional libraries is limited, commercial and industrial concerns will also be considered as possible sources of employment. The training guide can serve as a method in helping employers train blind employees. The Rehabilitation Counselor can use the guide to understand the training processes which the client must learn.

A few years ago, most tape recorders were two-track recorders. Today many companies are selling four-track machines and the four-track recorders are in popular use. A two-track tape is one that has the sound going in one direction on one track and reversing on the second. The sound goes from right to left on the top half of the tape and left to right on the bottom half.

The four-track tapes have the sound going from right to left, then from left to right, right to left, and again left to right. Some four-track tapes are recorded and played in stereo. The listener hears the sound on tracks one and three at the same time. Tracks two and four play simultaneously when the tape is reversed.

The first magnetic tape sound recorders of 1946 resembled those of the German broadcast equipment developed during World War II. The increased use of tape recorders in the home for commercially prerecorded programs has developed until at present it is a major facet of entertainment in the United States. These recorders are similar to those that many readers of regional libraries for the blind use. Although a wide range of recorders are available today, talking books on tape must be played on machines that can accommodate seven-inch reels.

Magnetic tape is a thin plastic backing or base on which microscopic magnetic oxide particles are coated with a thermal plastic binder. The most common width for tape today is one-quarter inch. The magnetic properties of recording tape are dependent on the formula used by the manufacturer. The recording tapes on the market today have been basically standardized in order that they can be used on any brand of recorder. A good magnetic tape may be erased and re-recorded many times. An important property of magnetic tape is that it can be edited--undesired portions may be erased or sniped out, and the tape spliced back together.

SETTING

Research and Demonstration Project RD-2049-S was carried out at the Virginia Commission for the Visually Handicapped in Richmond, Virginia. The facilities used were those of the Commission's Library and Vocational Rehabilitation Department. A model library was set up by the project supervisor. A Viking 235 Tape Duplicator was purchased. The trainees took over the duplication and distribution of the entire tape duplicated magazine section of the Virginia State Library for the Blind and Physically Handicapped. The model library had access to the names and addresses of the blind and visually handicapped readers who received the magazines. In addition to the Viking 235 Duplicator, a Tabum Duplicator belonging to the Library was available, and an Ampex Tape Duplicator was on hand. One client was given additional training on a Rawdon-Smith Duplicator. Other necessary equipment used in the Project included braille writers, dymo writers, tape recorders, typewriters, bulk magnetic tape erasers, file cards, file cabinets, special mailing envelopes for the distribution of tapes, shelving to provide a storage area for tapes and bulk magnetic tape.

METHODOLOGY

This project was conducted under the direction of William T. Coppage, Director of the Virginia Commission for the Visually Handicapped and carried out by Edward M. Navis, Project Supervisor. Joseph H. Wiggins, Supervisor, Vocational Rehabilitation Department of the Virginia Commission for the Visually Handicapped provided valuable assistance to both Mr. Coppage and Mr. Navis. Preliminary steps in the project

included a knowledge of duplicating equipment and the job possibilities in the areas that duplicating equipment is used. In order to become better acquainted with the recording and duplicating problems which blind tape duplicator technicians might encounter, the project supervisor visited specialists well established in tape duplicating. These included T. A. Benham, a blind physics instructor and manufacturer of the Tabum Duplicator; Ralph Beistline, a blind member of the Office of the Blind, Commonwealth of Pennsylvania and a former operator of a successful tape recording and duplicating studio in Harrisburg, Pennsylvania; and Alfred Korb, Division of the Blind of the Library of Congress.

Numerous commercial duplicating facilities were visited for the purpose of assessing job opportunities for blind technicians. The Audio Studios in Harrisburg, Pennsylvania and the Livingston Audio Products Corporation in Fairfield, New Jersey were most receptive to the idea of employing blind workers as tape duplicator technicians or in related jobs. Mr. Benham, Mr. Beistline, Mr. Byron Hawley of Livingston Audio Products and Mr. Richard Weaver of Weaver Audio Studios were subsequently appointed consultants for the project. Vernon Marvel of the Regional Library for the Blind and Physically Handicapped at the Virginia Commission for the Visually Handicapped also served as a consultant and his ideas concerning tape duplication in library work were useful in establishing the criteria for a job description of tape duplicating in a library for the blind.

Eight clients were selected to participate in the project during the time it was being conducted. The eye sight of these eight ranged from total blindness to 20/200 in both eyes. I.Q.'s were measured on the Weschler Adult Intelligence Scale (WAIS) and ranged from 71 to 132 (see page 7 and 8 for more detailed client information).

The knowledge gained from visits to experts in the field of tape duplicating served as a basis for developing a course of study for training the blind and visually handicapped as tape duplicator technicians. Many of the procedures used in making recordings for commercial announcements and regarding quality control were incorporated into the program.

The clients were instructed in the operation of the Viking Tape Duplicator Series 235, including the loading of tape onto the equipment and the threading of the tape through the recording heads and onto the tape reels.

The trainees were taught the actual operation of the equipment including--

1. How to turn the machine on and off.

2. How to start the duplicating of the tapes.

3. How to advance a tape by the fast forward method.

4. How to rewind the tapes.

5. How to unload the tapes from the duplicator.

6. How to make fine adjustments in order to produce a better quality of tape copies.

The adjustments in Item 6 included setting of the bias and the setting of equalization and recording levels.

The class learned various methods of quality control. One method was actual comparison of the copy with the master tape. For this procedure, the master and the copy were syncronized on two recorders of the same make. The master was played 1/10 of a second ahead of the copy. Thus, the students were able to directly compare the sound of the two tapes. The clients were also taught to spot check the tapes in order to make sure that they did have a good quality of sound, but the process did not always involve direct comparison. Records were kept of the number of tapes made and the clients made the same number as the manufacturer's specifications suggested.

To prepare the clients to work in the regional library for the blind a model library was set up and they were given a list of fifty readers who regularly received magazines that are produced on tape. Following the usual record keeping procedures the magazine was duplicated and distributed to the readers by the trainees.

A file was established that contained the titles of the magazines and the names and addresses of the readers. The trainees used the file to determine the number of copies of each magazine that were needed and who was to receive a copy of any given one. The file cards were all 3" X 5" index cards containing information in both print and braille. A dymo braille writer was used to place the braille on the cards.

The client after determining who was to receive a magazine charged the book to the reader and filed the card in the "out" file. When the book was returned, the client checked the card that was placed in the mailing slot and found the name of the book and the name of the person who returned the book. The reader's card was located and the book discharged. The envelopes used were the type found in all regional libraries serving the blind. The client after charging books, loaded them into mail containers that are provided by the regional library. The envelopes were placed on the containers and the tapes mailed to the readers.

When the tapes were returned, the recordings were discharged from the reader. The card was returned to the file and the tapes were erased and kept ready for new recordings.

The clients' performances were checked by the project supervisor. The clients were asked to duplicate tapes in a minimum amount of time and to produce a specified number of tapes a day. In the initial phases of training they were expected to produce twenty copies a day and were eventually able to work up to fifty-four copies a day--which meets manufacturer specifications. Their production was compared to the actual production of tapes that the manufacturer specified could be produced in an eight hour day.

The clients were also given problems dealing with library work such as typing labels and splicing tapes. They were given assignments to improve the quality of tapes by changing the speed of duplication. The trainees were able to produce tapes that were distributed to radio stations within Virginia and which contained messages from the Governor of the Commonwealth and from the Chief of the State Police.

RESULTS

The results of the project indicate that

1. A blind person can be trained to operate a tape duplicating machine efficiently.

2. A blind person can perform many duties in a commercial duplicating company as follows:

   A. Actual tape duplicating.

   B. Various quality control functions.

   C. Loading of tapes into cassettes or cartridges.

   D. Final packaging and shipping of tapes to their destination.

3. A blind person can label, identify and distribute tapes efficiently. (The totally blind person can charge and discharge tapes if a system is set up similar to the one used in this project and provided he is able to read and write braille.)

A training manual has been developed (see Table of Contents) to use in training the blind as tape duplicator technicians. This manual can serve librarians of the regional libraries, the operators of a commercial duplicating facility, the director of an educational tape duplicating operation, etc. These people should find the manual to be a helpful resource in training the blind for work in their operations.

In addition to the actual duplicating of tapes, it was found that a blind person working in a regional library for the blind would need to be able to label tapes, charge tapes to readers, discharge tapes to readers, pack the tapes in mailing containers, and perform quality control of tapes. Clients engaged in this project demonstrated that with proper training blind and visually impaired persons can efficiently perform the required tasks for getting the job done in a variety of settings.

In the commercial industry, tape duplication is only one of many jobs that a blind person can perform. Mastering the tapes, general quality control of tapes in the cartridges, overall quality control, loading tapes in the cartridges, tightening cartridges, preparing the cartridges for mail, and unloading scrap tape from bulk cartridges are but a few examples of other operations that can be performed. Elsewhere in this narrative reference has been made to other specific operations such as packaging and packing which are part of job requirements in the industry.

It was found that clients with useful residual vision could perform some additional tasks in connection with the total operation particularly in the shipping and receiving departments where address labels had to be spot checked and in other minor clerical capacities.

Information has been received that indicates the Library of Congress expects to use tape cassettes as a primary tape method for their programs.

The achievements of clients engaged in the project best tell the story of the results which were attained and following are brief individual summaries including client characteristics, training received and results:

Client A--Male--Vision in right eye, 10/200--Left eye, totally blind
IQ, low average

Client learned to operate Viking, Tabum and Ampex Duplicators and simple record keeping procedures without difficulty. He was found to have a hearing loss in one ear and since adequate hearing was found to be an essential part of duplication work, particularly in quality control, he was not employed in the duplication industry.

Client B--Male--Totally blind in both eyes
IQ, high average

Client learned to operate the Viking, Tabum, Ampex and Rawdon-Smith Duplicators. He performed all operations in the library without difficulty. He was placed in a commercial duplicating corporation and is now successfully performing his duties in the quality control department and does some tape duplication and mastering.

Client C--Male--Vision in both eyes, 20/200--IQ, high average

Client learned to operate the Viking Tape Duplicator equipment and to perform the library work. He is employed in a music company and his duties consist of duplicating tapes for distribution to department stores, restaurants and offices to be used as background music.

Client D--Male--Vision in right eye, light perception--Left eye, 20/200 with 50 degree field limitation--IQ, dull normal

Client learned tape duplicating on all machines and library procedures without any difficulty. He is now employed in a commercial duplicating corporation. He began work in the shipping department and moved into quality control and duplication. He is currently performing over-all quality control duties and is also responsible for final packaging.

Client E--Female--Right eye, totally blind--Vision in left eye, 20/200
IQ, high average

Client efficiently operated the Viking and Ampex Duplicators. She performed simple record keeping and library procedures efficiently. She is now employed as a tape duplicator technician in an agency for the blind. She performs all duplicating duties and prepares library tapes for the readers which include charging and discharging the tapes and necessary distribution processes.

Client F--Male--Totally blind in both eyes--IQ, dull boarderline

Client received training on a part time basis as he was attending public school. He made very little progress in training. He could perform one task such as threading the tape recorder. He could not proceed from task to task adequately to complete the work required of a tape duplicator operator. Emotional problems complicated this case and it appeared that the emotional factors retarded his learning ability more than the low I.Q.

Client G--Female--Totally blind in both eyes--IO, average

Client learned to operate the Viking and Tabum Duplicators and performed the prescribed library duties adequately. She received the training primarily for experience purposes and returned to school after the training period.

Client H--Female--Vision in right eye, 20/200--Left eye, totally blind IQ, superior

Client performed the duplicating operations satisfactorily on the Viking and Tabum Duplicators. She was unable to perform the library work as her spelling and typing were poor. She moved out of State and did not complete training.

There are numerous school systems throughout the United States which use tape duplicating equipment or will use the equipment in the future. Tape recordings are used in language laboratories and as audio aides for many classroom subjects such as English and history.

The commercial tape duplicating industry provides many employment opportunities for blind and visually handicapped individuals. There are many of these companies scattered throughout the United States but they seem to be concentrated mostly in northern New Jersey; New York City; Nashville, Tennessee; the Los Angeles area of California; and in Indianapolis, Indiana.

It is believed that blind and visually handicapped persons could work in the quality control sections of companies that produce discs recordings since they require essentially the same operations as does the commercial tape industry.

SUMMARY

This project has demonstrated that blind and visually handicapped individuals can be employed as tape duplicator operators and in related occupations in the field of tape duplication and recording.

The project supervisor visited numerous commercial companies that perform tape duplication. Many of their ideas along with the advice of people who are experienced in working with the blind were incorporated into a training program at the Virginia Commission for the Visually Handicapped. This program enabled the supervisor to train and place four clients in jobs involving tape duplication. Other clients were trained and prepared to perform the work but because of various personal problems were not placed into jobs.

Of the eight clients engaged in the Project--four are now employed, three in private industry and one in a regional library. One was not considered capable of completing training due to limited ability. Another had a hearing loss which made this type of employment unrealistic; one client was engaged in the Project on a part time basis and received benefits which contributed to her personal adjustment, but she did not complete training; the remaining client was not placed after completion of training, but is considered ready for employment.

Rehabilitation counselors and/or placement specialists interested in pursuing possible placement of their clients in tape duplicating jobs may find the following contact sources helpful: Local school divisions, advertising companies, small recording studios, colleges and universities, radio and television concerns.

Many Federal agencies produce tapes but these tapes are currently being duplicated by commercial companies. It would be helpful to ascertain which companies duplicate the tapes for the Federal Government.

Some state agencies have tape duplicating equipment, but in many instances it is used only periodically--perhaps one day a week. Such agencies may find it beneficial to put the equipment in one central place and employ a person or persons to duplicate tapes for all agencies. Such a plan would save the expense of individual agencies having to purchase and maintain duplicating equipment and would save other agencies not having equipment the cost of contracting for the duplication of their tapes.

II. PROJECT SUMMARY

The purpose of this Audio Tape Duplication Training Program was to assess the performance and capabilities of blind workers in the jobs of tape duplication and distribution. Specifically the aims of the Project were--

1. To demonstrate that a blind person can be trained to operate a tape duplicating machine.

2. To test the jobs of tape duplication, labeling, identification and distribution to determine which tasks can be performed efficiently without sight.

3. To determine those areas of operation in a regional library setting in which a blind person may be employed.

4. To determine which tasks in commercial tape duplication can be performed without sight.

5. To demonstrate that an instructor, without technical training in tape recording and duplication, can do an adequate job of training blind persons as tape duplicators.

6. To demonstrate that a blind operator can transfer the knowledge acquired from operating a two-track duplicating machine to the operation of a four-track system.

7. To prepare guidelines for use in the training of blind persons as tape duplicators.

The use of magnetic tape for purposes of instruction, business recording and listening pleasure has increased in recent years. As the use of tape increases so does the demand for additional tape duplicating sources and processes.

The Library of Congress has indicated that its need for tape duplication will appreciably increase in the near future. The Library produces "Talking Books" on magnetic tape for the blind and other physically handicapped. These books are read onto tape by volunteer readers. The tapes are checked for quality and then sub-master copies are distributed to the regional libraries. The regional libraries duplicate from the sub-master tapes and distribute copies to readers.

To determine whether blind and visually handicapped persons could be trained to do the necessary work in a regional library, a model library was set up at the Virginia Commission for the Visually Handicapped in Richmond, Virginia. A Viking 235 tape duplicator was purchased. The trainees took over the duplication and distribution of the entire tape duplicated magazine section of the Virginia State Library for the Blind and Physically Handicapped. In addition to the Viking 235, a Tabum Duplicator and an Ampex Tape Duplicator were available. One client was given additional training on a Rawdon-Smith Duplicator.

Eight trainees were selected ranging in age from 16 to 37 years. Their I.Q.'s ranged from 71 to 132 (WAIS--Weschler Adult Intelligence Scale). Both negro and white clients were used and their vision ranged from total blindness to 20/200 in both eyes.

The clients were instructed in the operation of the Viking Tape Duplicator including the loading of tape onto the equipment and the threading of the tape through the recording heads and onto the tape reels.

Next the trainees were taught the actual operation of the equipment including--

1. How to turn the machine on and off.

2. How to start the duplicating of the tapes.

3. How to advance a tape by the fast forward method.

4. How to rewind the tapes.

5. How to unload the tapes from the duplicator.

6. How to make fine adjustments in order to produce a better quality of tape copies.

The class learned various methods of quality control.

To prepare the clients to work in a regional library for the blind they received a list of fifty readers who regularly received magazines that are produced on tape. Following the usual record keeping procedures the magazine was duplicated and distributed to the readers by the trainees.

Trainees were also given problems dealing with library work such as typing, labeling and splicing tapes.

The results of the project indicate that--

1. A blind person can be trained to operate a tape duplicating machine.

2. A blind person can perform many duties in a commercial duplicating company.
   - A. Tape duplicating.
   - B. Various quality control functions.
   - C. Loading of tapes into cassettes or cartridges.
   - D. Final packaging and shipping of tapes to their destination.

3. A blind person can label, identify and distribute tapes efficiently.

In the commercial industry, tape duplication is only one of many jobs that a blind person can perform. They can master the tapes, perform general quality control of the tapes in the cartridges, overall quality control, loading the tapes in the cartridges, tightening the cartridges, preparing the cartridges for mail, and unloading scrap tape from bulk cartridges. Another job the totally blind person can do involves packing the cassettes in display cartons and sealing these cartons with a clear plastic covering.

It was found that clients with useful residual vision could perform some additional tasks in connection with the total operation particularly in the shipping and receiving departments where address labels had to be spot checked and in other minor clerical capacities.

There are a limited number of libraries for the blind and physically handicapped and, therefore, employment for blind people in this area is limited at the present time. The commercial industry then would seem to provide the best opportunity for blind and visually handicapped individuals to find employment.

Of the eight clients engaged in the project--four or 50 per cent are now employed by private industry or in regional libraries. One was not considered capable of completing training due to limited intelligence; another had a hearing loss which made this type of employment unrealistic after training; still another was engaged in the project on a part time basis and received benefits which contributed to her personal adjustment, but she did not complete training; the remaining client was not placed after completion of training, but is considered ready for employment probably in a commercial setting when a job opportunity is located.

Jobs are available but it cannot be repeated too often--the rehabilitation counselor must find them. He must seek out positions the clients can perform successfully. It may take pages of correspondence, many telephone calls, and many job surveys.

The Project has demonstrated that blind and visually handicapped persons can perform tape duplication to the satisfaction of the employer.

III. A GUIDE FOR TRAINING BLIND AND VISUALLY HANDICAPPED PERSONS AS TAPE DUPLICATING OPERATORS

The information used in developing this guide was gathered through experiences of the author while working with vocational rehabilitation clients who were participants in Research and Demonstration Project Number RD-2049-S.

The purpose of this manual is to outline the step by step training program used with selected visually handicapped persons in order to qualify them to perform the duties of a tape duplicating operator in the various work settings in which duplicating equipment is utilized.

This guide will also serve to inform vocational rehabilitation counselors and regional librarians as to specific procedures that may be used to train blind and other visually handicapped people to operate duplicating equipment.

The degree of intelligence needed to perform the duties of tape duplication is somewhat of an unknown factor. It appears that a person with dull normal intelligence could adequately operate the duplicator machine in simple duplication. However, in many jobs other duties are expected of the operator and it is these related duties which determine the degree of intelligence the individual must have.

Gross dexterity is more important than manual dexterity. The client must be able to make large movements such as using the whole arm to load a duplicator rather than just the fingers. However, finer dexterity is required to perform splicing (the repairing of broken tape). Except for splicing, the work of a tape duplicating technician involves handling rather large objects and does not involve fine coordination.

A totally blind client needs to have adequate mobility skills in order to move around in the commercial setting if the job requires him to move about. Commercial establishments often rearrange their facilities since they have a large number of tapes coming into the plant and a large number of tapes leaving the facility. These tapes are often stored in aisles thus making the walking area quite limited. Straight machine duplication generally would not require the individual to move but short distances from the work station.

A totally blind client needs some knowledge of braille in order to keep records of work and to write out special procedures. Typing ability is necessary in order that he may leave communications for the next worker on a shift. In libraries for the blind, braille and typing would be of utmost importance if the tape duplicator technician also had to label tapes and charge and discharge tapes to the readers.

The order of training includes a familiarization with magnetic tapes and theories of sound and recording. During this time the clients are introduced to the tape recorder. Next they learn the procedures for erasing tapes. They then learn the operation of a tape duplicator. The clients are then taught quality control. Once all these functions are learned they are integrated in such a way that while the client is actually duplicating tapes he is able to perform quality control.

Familiarization with Magnetic Tapes

A knowledge of magnetic tape is important. Magnetic tape has a recording side and a non-recording side. The recording side has a metallic oxide which faces the center of the reel. The non-metallic side is facing the rim or circumference of the tape reel. The oxide has a rougher texture and this texture is rough enough to be felt with the fingers. The difference is readily apparent since the non-oxide side of the tape is very smooth. For those clients with enough sight to see tape, they will notice that the non-recording non-oxide side is shiny while the inside or recording side of the tape is dull.

Theories of Sound and Recording

Since the actual duplication of magnetic tapes is only a small job in an occupation of tape duplicating, the prospective duplicating technician would benefit by familiarizing himself with the theories of sound and recording. Usually a high school physics book presents information concerning the theories of sound on a level that the average person can understand. This is the only knowledge that a duplicating technician needs to concern himself with regarding the theories of sound.

Introduction to the Tape Recorder

The operation of a tape recorder can readily be learned by most individuals. By listening to tape recordings, the client is able to distinguish between good tapes and tapes of poor quality.

Procedures for Erasing Tapes

The following are procedures used in erasing tapes:

1. Hold tape behind back in right hand. Turn eraser on with left hand and continue to hold the control in an "on" position.

2. Place tape on the eraser.

3. Turn the tape in a clockwise direction.

4. While holding the eraser switch in an "on" position remove the tape and place behind back.

5. Turn tape over.

6. Place tape on eraser and turn clockwise.

7. While holding switch in an "on" position remove the tape from the eraser.

8. Place tape behind back and release the "on" switch. The tape is fully erased.

Operation of a Tape Duplicator

There are many different manufacturers of tape duplicating equipment and many of these manufacturers produce more than one model of tape duplicating machine. Although the cost of these duplicating machines range from approximately $1,000 to $20,000, the operations of the various tape duplicating machines are approximately the same. In order to operate duplicating machine, it is necessary that certain operations be performed.

1. Turning on the power.

2. Loading the duplicator.

3. Threading the duplicator.

4. Recording or duplicating of the master tape.

5. Rewinding the duplicated tape.

6. Unloading the machine.

The above steps are usually performed; however, in a commercial industry, the rewinding is not an essential operation for the loading of cassettes and cartridges.

For the purposes of this guide, the Viking 235 Tape Duplicator was used to teach clients the procedures of tape duplicating.

Procedures in Training the Blind to Operate the Viking 235 Tape Duplicator

1. Use the left side of the duplicator as the starting reference point.

2. The power switch is turned to the "on" position.

3. Move from power switch to the recording switch which protrudes from the machine.

4. The speed switch has two positions. The position on the right will run the duplicator at 7 inches per second. When the switch is turned to the left it will run the duplicator at 7½ inches per second.

5. The control panel has four buttons. The first button is rewind. The next is play.

6. The client is asked to push the play button and the record button at the same time. This will duplicate tapes. The next button is the stop button. This button will stop the master tape. The next button is fast forward. This will advance the tape from one position to another at an extremely fast speed.

7. The client is then asked to move his hand straight above the panel. He will then come to slave number one. All slaves have the same controls as the master. Usually a duplicator comes with a master and three slaves. It should be noted that when the play button on a master is pushed along with the record button all slaves will start simultaneously if they are threaded with tape. If the tape on a master should break or come to an end, all slaves will stop. If one copy of the tape breaks or comes to an end, only that slave will stop. When the stop button is pressed on the master slave, all three slaves will stop.

Threading the Duplicator--

1. Place full reel of tape on the duplicator. The tape should fit tightly against the machine.

2. Tape is placed across the recording head and onto a take-up reel which has already been placed on the take-up hub. The tape should also cover the photoelectric cell which will automatically cut the master slave off when a bad recording area of the tape passes.

3. The tape is to be wrapped around the take-up reel until the tape is tight. This should be repeated for each slave.

Quality Control

Quality control is a method that commercial companies and libraries for the blind use to check their final products in order to insure that the tapes match the good listening standards of the original.

Clients listen to the master tape on one tape duplicator and listen to a copy on another machine of the same make. By listening to these tapes the client is able to compare the sound quality. If the quality of the copy does not match the quality of the master, then the client knows that the copy is not adequate. The client also can listen (spot check) to different parts of the tape to make sure that it is in good condition. While other tapes are being duplicated, he takes a tape from the first run of slave number one, from the second run on slave number two, and the third run from slave number three and spot check.

The actual training for a job as a tape duplicator technician is not long and is not involved. After the client receives the basic knowledge as outlined in this guide, he will be ready for employment. Once on the job he must learn the procedures of the company or library for whom he is working. These procedures vary from place to place just as the equipment that the client will use will vary. Many tape duplicating facilities prefer to teach their employees the operation on the job.

IV. CONFERENCE TO EVALUATE THE FEASIBILITY OF BLIND PERSONS AS TAPE DUPLICATOR OPERATORS

May 1, 1967

PURPOSE AND SCOPE

This conference was held to review employment possibilities in audio tape duplication as related to the visually handicapped. For this purpose persons with a wide variety of skills and knowledge of tape duplication were brought together to get an up-to-date and broad view of the field. It was also hoped that some reasonable forecast might be made at this seminar which would guide the Research and Demonstration Project into proper areas of investigation. The participants included interested parties from the Federal, State and local levels, both public and private (see attached list).

Experience of the tape duplicator project to date indicates a similarity in the basic elements of tape duplication and it varies primarily as to the type of machine used and the requirements or conditions of the operation. Since this conference was part of a Research and Demonstration Project to Assess the Proficiency of the Blind as Tape Duplicator Technicians, the experience of the project is also reflected in this summary.

PRESENT TRENDS

The use of magnetic tape for purposes of instruction, business recording and listening pleasure has increased significantly in recent years. The demand for additional tape duplicating sources and processes is an expected simultaneous development. The Library of Congress indicated that its need for tape duplication will appreciably increase in the near future. The tape program for the Virginia State Library for the Blind has grown. The number of requests for tapes for the fiscal year 1967 increased 50 per cent over the previous year. This expansion is in keeping with the experience of other regional libraries for the blind. Now that many libraries for the blind will be filling requests of the "physically handicapped" for recorded readings, it will also likely have an influence on the libraries in their use of tape. The increased utilization of tape appears to be especially apparent in commercial and educational settings.

Participants foresee the following trends in tape duplication and its relationship to blind duplicator operators: (A) The general use of tape is increasing with subsequent opening of auxiliary jobs associated with tape duplication. (B) The prospects for commercial employment of blind and visually handicapped persons as tape duplicator operators should be enhanced as it becomes known and accepted that they can successfully perform the duties. (C) As regional libraries for the blind expand their tape programs, job possibilities for blind tape duplicator operators within the libraries will increase.

TRAINING AND JOB CHARACTERISTICS

At the present time it usually takes from two to three months to train tape duplicator operators for jobs in the commercial field. Commercial tape duplicating requires an operator to develop speed as he becomes better acquainted with the equipment through regular operation. In a large company the duties of the operator may only require the individual to duplicate tapes; in a smaller company the job may also include quality control, labeling of tapes and keeping records of production. It is important that a duplicator operator have an appreciation for the work and to know that there is more to the position than just the mass duplication of tapes. He must perform quality control, keep a record of production, keep finished products in good order and move tapes to the next station. He must perform duties such as cleaning the machine, restocking and labeling tapes. In small companies the operator often has to switch the recording heads on duplicating machines in order to copy two, four or eight track tapes. Blind persons perform this mechanical operation with no difficulty. Some of the larger companies have duplicator machines for each type of tape eliminating the need to change recording heads.

The position of quality control is especially suitable for a blind person. The duties include (1) listening to tapes to identify sounds inappropriate to the recording (2) checking for proper balance in stereo quality (3) checking tone quality and (4) identifying "drop outs". The latter is an occurrence of a brief loss of sound less than one-eighth of a second. It is especially important for the quality control person to have good hearing to identify drop outs. The duplicator operator in a public school system usually does not need an extensive training course. Training involves operation of duplicating machine, labeling tapes and distribution.

CLIENT CHARACTERISTICS

Personal appearance is important, however, it is not a prime consideration as in most instances operators are not required to meet the public. Duties on the job generally do not require frequent moving about in unfamiliar surroundings so the individual's independence in mobility may concern mainly the client's reaching the job and returning home. A minimal functional intellectual level has not been clearly established and would relate to the type of duplicating operation. It appears that a person with dull normal intelligence could perform the duties of a simple duplicating machine operator. However, if the job requires additional tasks such as labeling, record keeping and note taking, then this calls upon skills in the areas of typing and braille. A quality control position requires average judgement and, therefore, one could assume that average intelligence would be necessary. Usually when the job requires braille and/or typing, minimal braille and/or typing skills will suffice as it is primarily used for labeling purposes. Experience indicates the operator should have normal, uncorrected hearing in both ears as even in the simple duplicating operations there are certain intervals at which checks are made on the quality of tapes by listening to them. This is especially true in commercial settings, however, in public school systems it may not be a prime factor.

CONCLUSION

It was generally concluded by the participants that blind persons can successfully function as tape duplicator operators in most of the job situations discussed at this conference. The Research and Demonstration Project at the Virginia Commission for the Visually Handicapped, Richmond, Virginia has demonstrated to date with two types of duplicating machines that blind persons can efficiently function as tape duplicator operators. The predictability for job placement is unknown at this time as placement experience has been limited. However, since tape reproduction is expected to expand it is naturally assumed that employment opportunities and job placement for the blind would also appear encouraging.

It was recommended the Project give emphasis to the investigation of employment possibilities for blind tape duplicator operators. It was also felt the Project should receive more publicity and could be accomplished by forwarding the conference summary and progress reports to regional libraries for the blind, school divisions, state departments of education and the President's Committee on Employment of the Handicapped.

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V. PROJECT: RD 2049-S, Supplemental Grant

PURPOSE

This grant was made to enable the Virginia Commission for the Visually Handicapped to develop, produce, staff, and evaluate an exhibit designed to show the scope of the program of the Rehabilitation Services Administration to persons whose visual impairment makes it difficult or impossible to profit from the usual exhibit designed primarily for visual communication.

METHODOLOGY

The major item of the exhibit was an especially adapted switchboard for use by blind operators. Ten telephones were connected with the switchboard and placed on an adjacent table. Alongside the telephones was a list, both inkprint and Braille, listing eleven messages which could be heard by asking the operator for a specified number. The eleven messages describing various projects of RSA were placed in eleven Code-A-Phones and connected with the switchboard. A twelfth Code-A-Phone was reserved for persons visiting the exhibit to use in making their comments. In addition, a continuous tape bearing a message from Miss Mary Switzer and Mr. Louis Bives was used through a low key speaker to explain the exhibit and to interest people in using the telephones. The telephone equipment was loaned and installed by the Southern Bell Telephone Company. Two blind telephone operators were employed to man the switchboard continuously during the time the exhibit was open.

In addition to these recorded messages about RSA there was a table on which was displayed, for tactile examination, devices developed through grants from RSA. These included the raised line drawing equipment from Recording for the Blind, a Pathsounder, collapsible canes, an audible ball from Massachusetts Institute of Technology, and upwriting Braille slates and collapsible canes developed by the IIT Research Institute. Also two of the Kay Guidance devices were ordered from England and were displayed.

SUMMARY

This exhibit created a great deal of favorable attention the two times it was shown, at the 1967 AAWB Convention at the Deauville Hotel, Miami Beach, Florida in July and at the joint regional conference of the AAIB and AAWB in Harrisburg, Pennsylvania in November of 1967. All of the recorded comments received on the Code-A-Phone reserved for that purpose, were highly favorable.

Many people made repeated visits to the exhibit and asked for different messages until they had heard all of them. The cooperation and generosity of the Southern Bell Telephone Company in providing, installing, and maintaining the equipment added greatly to the success of the exhibit. The delightful personalities of the telephone operators also contributed greatly. Excellent publicity was received in the newspapers and on television.

BIBLIOGRAPHY

Athey, Skipwith W.: "Magnetic Tape Recording"; Published by National Aeronautics and Space Administration; Washington, D. C.; January, 1966

Read, Oliver; "The Recording and Reproduction of Sound"; Published by Howard W. Sams and Company; Indianapolis, 1952.

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TO ASSESS THE PROFICIENCY OF THE BLIND AS TAPE DUPLICATOR OPERATORS... (1968)

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